SECTION 2
INSTALLATION

2.1. UNPACKING

To avoid damaging the equipment, use caution when uncrating the transmitter and components. All units should be inspected carefully. Check for loose screws and bolts. Inspect all controls, such as switches, for proper operation as far as can be determined without application of power. Examine cables and wiring, and make sure that all connections are tight and clear of each other and of the chassis. Claims for damage should be filed promptly with the transporation company.

2.2. LOCATION OF THE TRANSMITTER

It is recommended that the transmitter be placed in its permanent location before the units that were removed for shipping are replaced. The comparatively simple arrangements to accommodate power input, audio input, frequency monitoring, modulation monitoring, and audio monitoring are illustrated in figures 7-5 and 7-6. The external wiring requirements may be met by laying necessary conduit in a concrete floor, or by installing a wiring trench of sufficient size. Another alternative would be to build a false floor under which the necessary wires and cables can be placed. The trench will have to accommodate a three-wire power cable, two shielded twisted pairs, and two RG-8/U coaxial cables. It is very desirable to have several ties from the transmitter cabinet to the building's ground system.

Adequate clearance should be allowed in front of the transmitter. There should also be a clearance minimum of three and one-half to four feet behind the cabinet to provide sufficient room for service work.

2.3. REPLACEMENT OF UNITS REMOVED FOR SHIPPING

Several of the transmitter components have been removed and packed separately for safety in shipping. These include heavy units such as the high-voltage transformer, modulation transformer, high-voltage filter choke, large filter capacitors, and the small, fragile units such as tubes and crystals. The Inter-Unit Cabling Diagram, figure 7-6, and the Typical Installation Diagram, figure 7-5, as well as the photographic illustrations will be of assistance in replacing and connecting these components in the transmitter.

Wires and cables that were removed from the units to which they connect were tagged before shipment. Should any of these tags become lost, refer to the Inter-Unit Cabling Diagram, figure 7-6, for assistance in identifying the leads.

The following installation procedure is recommended:

a. Set the tubes and crystals aside. They should not be placed in the transmitter until all other units have been installed and connected. Reference to figure 6-3, 6-5, and 6-8 will aid in placing them in their proper positions.

CAUTION

EXTREME CARE SHOULD BE EXERCISED WHEN HANDLING THE CRYSTALS. THIS NEW TYPE OF CRYSTAL IS EXTREMELY FRAGILE. FOLLOWING ROUGH HANDLING THE CRYSTALS MAY STILL OSCILLATE, BUT MAY HAVE LOST THEIR HIGHLY IMPORTANT FREQUENCY VS. TEMPERATURE CHARACTERISTICS.

b. Note terminal numbers of the iron-core components before they are installed. Identification of these terminals is sometimes difficult after the components are in the transmitter.

c. Refer to figure 6-2 for the proper placement of the heavy iron-core components and install them in their proper locations in the lower part of the transmitter.

d. Check the station line voltage. Refer to figure 7-4 and make connections to the high-voltage transformer primary terminals that most nearly correspond to this voltage. If the nominal station voltage is very low, the 208-volt taps on the 575A filament transformer, the main filament transformer, and the low-voltage plate supply transformer should be used. The bias supply transformer primary is not tapped, but a correction may be made for a very low nominal line voltage by changing the value of the bias supply bleeder resistor, R-174, from 2000 to 2400 ohms.

CAUTION

DRESS ALL WIRES AWAY FROM THE HIGH VOLTAGE PLATE TRANSFORMER. FAILURE TO DO SO MAY RESULT IN VOLTAGE BREAKDOWN BETWEEN THE WIRE AND THE TRANSFORMER.

e. Refer to figures 6-2, 7-5, and 7-6 as well as the tags on the cables in order to make all possible connections at this time.

f. Install and secure the large filter capacitors in their proper positions as shown in figure 6-2 and make all connections to these units.

g. Remove the rear cover from the r-f output network and set the taps on tuning coil L-108 and loading coil L-109 to the positions shown in table 2-3 that correspond to the station operating frequency. The Collins Test Department data sheet included with the transmitter contains a record of the output network setup used for testing the transmitter at the factory. These conditions may not hold exactly under actual operating conditions, but are normally near enough to give a starting point for tuneup.

2.4 POWER INPUT CONNECTIONS

Refer to the Typical Installation Diagram, figure 7-5, for proper wire sizes and location of the power line accommodation hole in the bottom of the transmitter. Bring the neutral wire and the two power wires in through the rubber grommet in this hole and run them forward to the front panel. Connect the two power wires to the two outer terminals on terminal board E-100 illustrated in figure 6-1. The neutral wire should be connected to the center terminal of E-100.

2.5. AUDIO INPUT CONNECTIONS

The audio signal should be brought into the transmitter cabinet on a shielded twisted pair. Use the audio input hole illustrated in figure 7-5 for these wires. The audio input connections are made to terminal board E-103 located inside the lower shelf of the modulator chassis. The location of this terminal board can be seen in figure 6-6. Connect the two leads of the twisted pair to terminals 4 and 5 of E-103. Connect the shield to terminal 3 of E-103.

2.6. R-F OUTPUT CONNECTIONS

A solder type coaxial end seal terminal for connecting to the r-f output coaxial cable is located on top of the output network box and may be reached through a hole in the top of the cabinet. The coaxial cable leading to the antenna tuning house should be securely soldered to this terminal.

2.7. FREQUENCY MONITOR CONNECTIONS

Coaxial frequency monitor connector J-104 is located on the bottom of the r-f chassis. The transmitter is shipped with a mating plug connected to J-104. Bring a piece of RG-8/U coaxial cable through the proper hole in the floor of the cabinet, as shown in figure 7-5, and connect it to this plug.

2.8. MODULATION MONITOR CONNECTIONS

Coaxial modulation monitor connector J-100 is supplied with the proper mating plug. This connector is located on the top of the r-f output network box. Thread a piece of RG-8/U coaxial cable through the proper hole in the floor of the cabinet as shown in figure 7-5. Connect the coax to the plug associated with connector J-100.

2.9. AUDIO MONITOR CONNECTIONS

A shielded, twisted pair should be used for the audio monitor connections. Bring this wire through one of the monitoring lead holes in the bottom of the cabinet. The audio monitor terminal board, E-104, is located inside the lower part of the r-f chassis as shown in figure 6-9. Access to this terminal board can be gained by removing the lower cover of the r-f chassis. Connect one wire of the shielded twisted pair to one of the terminals on E-104. Connect the remaining wire and the grounded shield to the other terminal.

2.10. INTER-UNIT CABLING DIAGRAM

The Inter-Unit Cabling Diagram, figure 7-6, shows the parts of the transmitter in their general locations as viewed from the rear. Each section of this diagram is enclosed by broken lines. These sections have been given section designation letters that appear in the upper right-hand corner of each dotted enclosure. Although wiring between transmitter units is not shown on the diagram, the destination of this wiring is indicated by numbers and letters that appear directly below the arrow heads as shown in figure 2-1. The numbers to the right

of the lines above the arrow heads represent the type of wires used. The number directly to the right of each arrow head is the number of that point on the diagram and does not necessarily indicate that there is a terminal bearing that number at that point in the equipment. Where there are terminal boards with numbered terminals in the equipment, the terminals are represented on the diagram by small circles enclosing the number of the terminal. The terminal board is represented by a dotted line around all terminals on that board. Some sections of the diagram, such as section F, require that the terminal board in the diagram be broken to allow lines that do not terminate on that board to pass through the area on the diagram where the board is drawn.

A small portion of unit F from the Inter-Unit Cabling Diagram, figure 7-6, is shown in figure 2-1. The two KE0 designations indicate that two KE0 wires leave this point. The K in KE0 indicates the type of wire (high voltage insulated cable). E indicates size of wire (#14 AWG). The 0 is a numeral indicating the color of the wire used (black). If a tracer were used on this wire an additional number would be added to indicate the color of the tracer. For example, if this wire were black with a red tracer, the designation would have been KE02. If a shield were used, the wire would be called KES02, the S indicating a shield. The color code used for wires and tracers is the same as that used for resistors and condensers.

The number 18 shown beside the arrow head indicates that this is point number 18 on the diagram.

A7 indicates that one of the wires leaving this point on the diagram goes to point 7 on unit A of the diagram. J7 indicates that one of the wires leaving this point on the diagram goes to point 7 on unit J of the diagram.

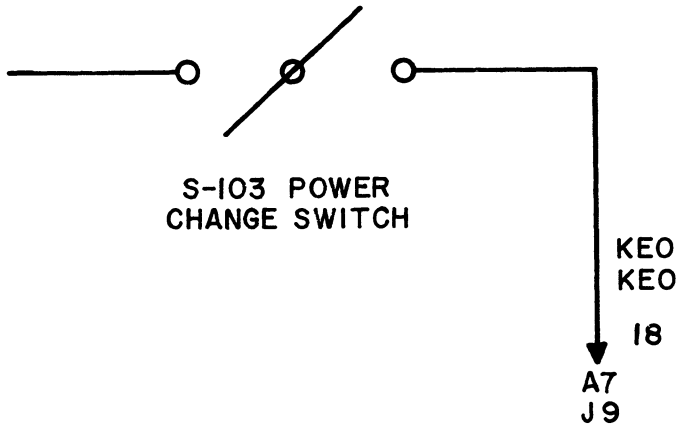

Figure 2-1. Inter-Unit Cabling Example

When coaxial cable, copper straps, and other types of connecting materials except wires are used, the "type of wire" code is not used. Instead of using a code, the connecting material is specified by name on the diagram, as in the case of the copper strap shown at point 1, unit C.

Table 2-1. List of Wire Types

Letter	Type of Wire
A	AN-J-C-48
B	Busbar, Round Tinned Copper
C	JAN Type WL (600 volts)
D	Miniature JAN wire
F	Extra-Flexible Varnished Cambric
G	General Electric Deltabeston
K	Neon Sign Cable (15,000 volts)
N	Single Conductor Stranded (Not Rubber)
P	Single Conductor Stranded (Rubber Covered)
R	JAN Type SRIR (1000 volts)
V	JAN Type SRHV (2500 volts)

Table 2-2. List of Wire Sizes and Color Codes

Letter	Size of Wire (AWG)
A	22
B	20
C	18
D	16
E	14
F	12
G	10
H	8
J	6
K	4
L	2
M	1
N	0
P	00
Q	000
R	0000

Number	Color of Wire or Tracer
0	Black
1	Brown
2	Red
3	Orange
4	Yellow
5	Green
6	Blue
7	Violet
8	Grey
9	White

Cable Identification Example:

A JAN Type WL, #22 AWG, shielded, white wire with red tracer would be labeled CAS92. A black #14 AWG neon sign cable would be labelel KEO. A breakdown of these two descriptions is shown on the next page.

C	A	S	9	2
Type of Wire	Size of Wire		Color of Body	Color of Tracer
Jan Type WL	# 22 AWG	Shielded	White	Red

K	E	O
Type of Wire	Size of Wire	Color of Body
Neon Sign Cable	#14 AWG	Black

2.11. CONTROL CIRCUIT CONNECTIONS

A 16-connection terminal board, E-105, is provided, at the rear of the power supply chassis, for control circuit connections. These terminals may be used to interlock the 20V-2 with other equipment. Remote control switches and indicator lights may also be connected to terminals on this board. A remote filament indicator lamp may be connected across terminals 4 and 5; 230 volts ac is present on these terminals at any time that the filament circuits in the transmitter are energized. In like manner, a 230-volt plate indicator lamp may be connected across terminals 10 and 11. For remote operation of the filament circuits, connect a normally open momentary switch between terminals 2 and 6 for filament starting, and remove the jumper between terminals 6 and 13 and connect a normally closed momentary switch to these terminals for filament stopping. A plate on switch with normally open momentary contacts may be connected to terminals 6 and 8, and a plate off switch with normally closed momentary contacts may be connected in place of the jumper between terminals 7 and 12. For simplified operation, the filament on and plate off switches may be eliminated; when the plate on switch is operated, both filament and plate power will be automatically applied in proper sequence. Operation of the filament off switch will shut down all filament and plate power that may be on.

2.12. ARC GAPS

Inspect the arc gaps listed below for burrs, scratches, or sharp edges. If any are found, remove them with crocus cloth. Set gaps as follows:

Plate tuning capacitor gap 5/16 to 21/64".

Loading capacitor gap 1/16 to 5/64".

Ant. coupling capacitor gap 1/32 to 3/64".

Modulation transformer gap 1/16 to 5/64".

Table 2-3. Approximate Output Tank Tuning Data